

Bush Terminal Company  
(Bush Terminal)

Between Second and Third avenues  
from 39th to 41st streets, and  
from 44th to 50th streets;  
between First Avenue and the  
U.S. pierhead line, from 39th  
to 51st streets

Brooklyn  
Kings County  
New York

HAER No. NY-201

HAER  
NY,  
24-BROK,  
54-

PHOTOGRAPHS

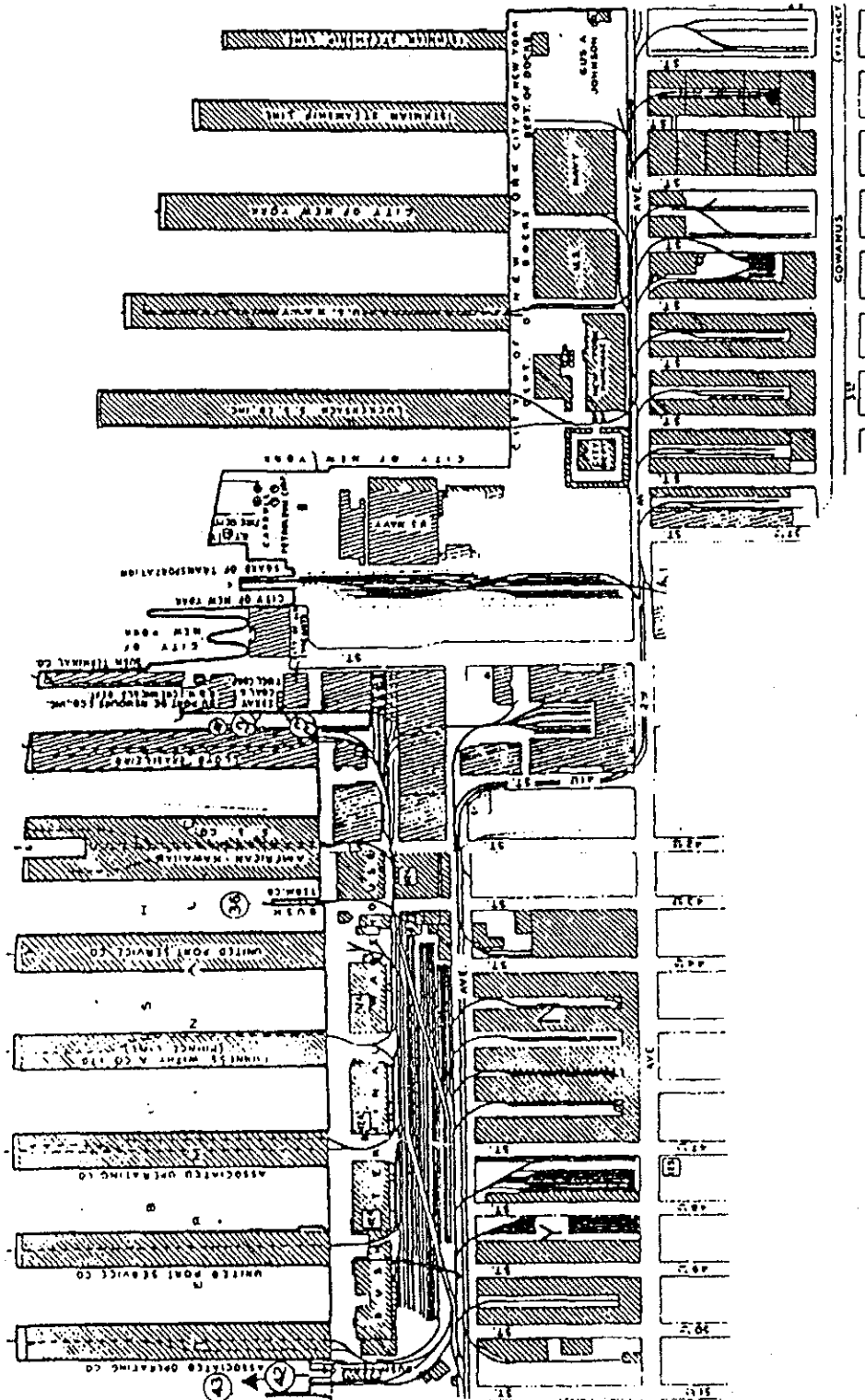
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record  
Mid-Atlantic Region  
National Park Service  
U. S. Department of the Interior  
Philadelphia, Pennsylvania 19106

Bush Terminal Compny  
 (Bush Terminal)  
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KEY TO PHOTOGRAPHS



HISTORIC AMERICAN ENGINEERING RECORD

HAER  
NY  
24-BROOK,  
54-

BUSH TERMINAL COMPANY  
(Bush Terminal)

HAER No. NY-201

Location:

In three large parcels totalling about 200 acres:

Between Second and Third Avenues from 32nd to 37th streets, with the exception of the buildings fronting on Third Avenue between 36th and 37th streets (most of blocks 691 and 695; all of blocks 679, 683, 687);

Between Second and First avenues from 39th to 41st streets and from 44th to 50th streets, being blocks 706, 726, 735, 762, 771;

Between First Avenue and the waterfront on Upper New York Bay from 39th Street to 51st Street, including the land underwater as far as the U. S. pierhead line (being blocks 710, 915, 725);

In addition, the tracks of the Bush Terminal Railroad are located in adjacent portions of First and Second avenues.

This documentation concerns primarily the adjacent second and third parcels, which include the Bush Terminal waterfront. Mapped points below refer only to these two parcels (see Figure 1).

UTM Coordinates:	A	18.582940.4501170
	B	18.582390.4500540
	C	18.582860.4500170
	D	18.582900.4500210
	E	18.583100.4500060
	F	18.583380.4500440
	G	18.583200.4500570
	H	18.583350.4500750
	I	18.583350.4500620
	J	18.583620.4500750
	K	18.583300.4500990
	L	18.58325-.4500960

U.S. Quadrangle: Jersey City, New Jersey - New York

Bush Terminal Company  
(Bush Terminal)  
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Dates of Construction: 1902-09 Piers completed, with Short Pier and Piers 6 and 7, including components, dating to the 1880s  
c. 1892-1910 Warehouse built  
c. 1896-1915 Bush Terminal Railroad built  
c. 1905-1925 Factory Lofts built

Planner: Irving T. Bush

Design Consultant: E. P. Goodrich, Chief Engineer, Bush Terminal Company

Factory Loft Design: William Higginson

Contractors: Factory lofts: Turner Construction Company,  
New York, NY

Piersheds: American Bridge Company, New York,  
NY (through subsidiaries Post &  
McCord and New Jersey Steel and  
Iron Company)

Present owner: Multiple; parcel including piers owned by New York City  
Department of Ports, International Trade, and Commerce,  
Battery Maritime Building, New York, NY 10004

Present use: Mixed industrial/commercial on upland; piers vacant,  
last used for cargo handling c. 1980

Significance: Bush Terminal was the first American example of  
completely integrated manufacturing and warehousing  
facilities, served by both rail and water transporta-  
tion, under a unified management. It was the largest  
multi-tenant industrial property in the United States.  
Largely intact today, it remains the largest unified  
non-railroad terminal ever built in the Port of New  
York, and retains a rare survival of an isolated urban  
freight railroad served only by transfer bridge.

Project Information: Bush Terminal is eligible for inclusion on the National  
Register of Historic Places. Piers 5 and 7 contribute  
to the significance of the terminal complex. As part  
of the New York Harbor Collection and Removal of Drift  
Project implemented by the Army Corps of Engineers, all  
components of these piers, except the solid fill cores,  
will be removed. This documentation does not encompass  
the entire terminal in great detail. Rather, it

provides general historical information on the terminal as a whole, and meets conditions for mitigating adverse effects to Piers 5 and 7 according to the terms of a Memorandum of Agreement among the Advisory Council on Historic Preservation, the New York State Historic Preservation, and the New York District, Corps of Engineers. Further information on Piers 5 and 7 appear in, respectively, HAER Nos. NY-201-A and NY-201-B. Project actions may occur as early as 1989.

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## PART I: HISTORICAL INFORMATION

### A. The South Brooklyn Waterfront and Bush Terminal Origins

Brooklyn's industrial waterfront expanded rapidly c. 1840-1880 south of the East River, reaching Gowanus Bay and including creation of the Gowanus Canal c. 1867-1873. Industrial development south of the canal was limited by distance from the port's Manhattan commercial center, lack of street railways and railroad freight service, and shallow offshore conditions which increased pier construction costs. Elevated street railways expanding south of the canal in the 1880s encouraged residential growth of European immigrant communities in what became the Sunset Park area. Railroad freight service, critical to movement of goods across and around the harbor, arrived more slowly. Local rail companies built several freight piers in the 1880s to serve nearby lumber and coal yards, and other bulk product handlers, but most of these freight stations were short-lived. Uncertainties about federal construction of a deepwater channel allowing passage of ships, and absence of shoreline or marginal rail connections between freight terminals, limited investments in South Brooklyn waterfront transportation. A passenger ferry at 39th Street, planned as a possible freight station, closed in 1898 after about nine years of operation. By 1895, the most important industrial features on the South Brooklyn coast were the beginnings of a Long Island Railroad (LIRR) freight terminal at 65th Street, a few shipyards using small, inexpensive pile piers, and a few manufacturers requiring only lighterage facilities (Stiles 1870: 582-84; Brockett 1884: 643; Robinson 1886; Bromley 1893; Seyfried 1966, 4, 94; Ment and Donovan 1980: 57-65; Raber, Flagg, Parrott et al. 1984: 30-31, 63-91; Raber et al. 1985: 22-26).

The Bush and Denzlow Manufacturing Company, operating at the foot of 41st Street on Upper New York Bay, was a small oil refining company in this period. Little is known of the firm at present, but by 1890, when partner Rufus T. Bush died, it was a subsidiary of Standard Oil Company. Bush's son Irving inherited some capital and two large waterfront lots, on which a wide, incomplete pier stood, filled with ashes from the refinery and other debris. The refinery property, purchased by the younger Bush from Standard Oil in 1902, was on an adjacent solid-fill pier which was later rebuilt as Bush Terminal Pier 7. Bush resigned from Standard Oil by c. 1895 to pursue his plans for a waterfront terminal in a very unpromising location, and by c. 1900 had attracted just enough shipping and warehousing business to consider implementing a daring design (Bush 1928).

### B. Irving Bush's Terminal Design and Its Significance

Irving T. Bush (1869-1948) started with undeveloped and partially developed waterfront property c. 1894 and made the terminal fully functional in every aspect by about 1915. Bush later said that the piers were the foundation of

the terminal concept in his mind, based on his boyhood fascination with ships, and dreams of providing a better system for handling cargoes than existing Port of New York pier facilities (Bush 1928: 10-12). But better piers were not what made Bush Terminal so radical; rather it was the way these piers articulated with other elements of commerce. Bush's idea was to provide enterprises of all sizes and types with the kind of facility normally affordable only to the largest, wealthiest concerns: clean, well-lit space with modern utilities and large freight elevators in modern buildings, with a private rail siding at the door served by all railroads equally, with all modern utilities, piers nearby, and plenty of space available for expansion in the same complex. Bush compared his terminal to a modern apartment house, giving every tenant the comfort and service enjoyed by the man who owned a mansion (Bush 1928: 78-79). Even the largest companies rarely enjoyed all these benefits, and for the small concerns who typically rented Manhattan loft space, Bush Terminal was indeed a major business innovation.

When fully developed, Bush Terminal was a 200-acre industrial complex (see Figure 2. Bush originally owned more land than is delineated in Figure 2, but sold parcels to industrial firms and to the U. S. Navy without building on them himself. The Bush Terminal Railroad continued to serve these parcels.) Seven deepwater piers extending out from a bulkheaded shore into Upper New York Bay, leased to various cargo or steamship lines, were the foundation of the terminal. Their necessary location adjacent to a deep water channel determined the location and, to some extent, the plan of the entire terminal. Behind these piers, Bush provided a working bulkhead for handling cargoes going to and from the steamers at the piers, and to and from the lighters that once handled tremendous amounts of intra-port traffic within the Port of New York. Back of the bulkhead lay more than one hundred warehouses for the temporary storage of freight from steamships, awaiting distribution. Behind the warehouses was a large railroad yard, the central sorting point for freight cars from all portions of the terminal.

Bush Terminal Railroad, with its branches going into all parts of the terminal including the piers, its carfloats and tugs for interchange with the rest of the port, and its commercial integration with all other railroads throughout the United States (by virtue of its being a contract terminal for all trunk lines), was the circulatory system of the terminal and the key element of its integration. It entirely removed the cost to the shipper of the haul by truck or dray to the railroad freight station. It also provided service to local non-Bush-owned properties, by way of its public freight stations at various points in the terminal. In this capacity, it helped industrial south Brooklyn by allowing shippers in or near the terminal to send freight by way of any North American railroad through a local railroad company. The Bush Terminal Railroad was critical in providing rail links to other American lines, by way of transfer bridges at 51st Street and at the LIRR yards at 65th Street. Transfer bridges facilitated freight car movement across the harbor, and

eliminated Brooklyn's relative isolation from major rail connections made through the port of New Jersey, Manhattan, and the Bronx.

There were fifteen multi-story industrial loft buildings behind the railroad yards, providing affordable space, in any amount, to industrial tenants. The Bush organization, as landlord, also took responsibility for transferring all freight into the cars of the Bush Terminal Railroad. The manufacturer had only to load his goods onto or off the large capacity freight elevator serving his floor.

The terminal also provided utilities to service the entire complex: two power plants for steam, heat and light, an electrical distribution system, and all other necessary utilities. There was also space for a bank, restaurants and cafeterias, a medical center for the workers, a center for longshoremen and, in earlier years, even a trolley running on the freight tracks to provide transportation for workers. Bush was dedicated to the welfare of the workers at Bush Terminal, only because (as he frankly stated) their welfare and morale were critical to the prosperity of his business tenants.

Until the 1930s, a single management organization oversaw the entire complex, dedicated to the welfare of business concerns of all sizes, equally proud of housing large concerns whose names were household words and small, new businesses. Bush Terminal Company not only provided space, transportation, utilities and social services, it also provided extensive commercial services for remote businesses. It accepted shipment of goods of all kinds from such businesses and undertook to warehouse such goods, releasing them to whatever consignee the owner might designate. Thus, a producer could keep "spot stock" at Bush Terminal and not have to open a branch in the New York Region at all. Bush Terminal would also undertake to display samples of the goods to buyers in showrooms it owned in Manhattan; to divide, repack, label, and itself deliver such goods in the region or to foreign countries; and to arrange for insurance (Bush 1917; Chase 1931: 262). This range of services was probably never before offered by one management.

The Great Depression forced Bush to retrench somewhat, and his firm stopped acting as agents for manufacturers. Operations came to resemble something closer to a modern industrial park. Bush split management operations between the factory loft buildings, run by a separate Bush Terminal Buildings Company, and the piers, railroad, and warehouses which continued to function as Bush Terminal Company under his presidency until his death.

Bush Terminal became the spark for the development of much of the South Brooklyn waterfront south of 29th Street between c. 1905 and 1925, by both public and private developers. Bush's success, and his active promotion of the area, spurred municipal waterfront construction by the New York City Department of Docks and Ferries north of Bush Terminal. With its worker



population of 30,000, the terminal was an extremely important source of employment for the recent Italian and Scandinavian immigrants settling in the upland behind the waterfront. Industrial properties flourished beyond the properly lines of Bush Terminal, owned and used by other companies but served by the Bush Terminal Railroad (Staniford and Guise 1912; Raber et al. 1985; Historic American Engineering Record 1988a).

Transportation experts of the time hailed Bush Terminal as a significant advance. Consulting engineer B. F. Cresson called it "probably the finest example of terminal development on the Atlantic Coast, if not anywhere in the world" (New Jersey Harbor Commission 1914: 52). The successful building and operation of this integrated terminal led to Bush's recognition as a leading expert on terminal facilities in the nation's harbors; he was consulted by many municipalities and also by the military. During World War I, he directly inspired the construction and design of the Brooklyn Army Terminal just to the south, was appointed Chief of Embarkation for the Port of New York, and served as chief executive of the War Board of the port (Historic American Engineering Record 1988b; New York Times 1948). His terminal was also the model for another integrated commercial terminal Bayonne, New Jersey, that was converted into the Bayonne Naval Base shortly after it opened in 1940; this site today remains one of the busiest military ocean freight terminals in the world. Bush's multi-tenant loft buildings, with rail and pier access, were emulated elsewhere in the port and in other harbors, such as in the Port of New York, with principal examples being the New York Dock Company, the Jay Street Connecting Railroad, and the Brooklyn Eastern District Railroad in Brooklyn, and the Lehigh Valley Railroad's architecturally-distinguished Starrett-Lehigh Building in Manhattan. No other project matched the original Bush Terminal in size or in full integration of the elements of commerce under one management.

### C. Terminal Components and Development Sequence

Until Bush acquired some significant financing and began a massive building program c. 1902, the terminal remained very limited. Between c. 1984 and 1900, he built six warehouses, an office, some tracks, and various sheds on older solid fill piers (later Piers 6 and 7). He bought additional waterfront property in 1902, and completed most of the facility by 1915, although additional industrial loft buildings were added in the 1920s (Bush 1928).

#### 1. Piers

Bush Terminal's seven principal piers extended from a timber bulkhead built near the original shoreline, with some removal of upland to provide a uniform bulkhead line and more dockage. An eighth, much smaller pier to the north was added by 1920 and sold in 1958. These eight piers extended to the federal pierhead line; the slips between them were dredged to 32 feet. A much shorter ninth pier, between Piers 5 and 6, provided additional facilities for direct cargo transfers between terminal warehouses and

lighters. Most piers had railroad tracks on them at various times (see Figure 2; Harris 1958) [see also HAER Photographs No. NY-201-1, NY-201-2 and NY-201-3].

Piers 1, 2, 3, 4, and 5, built or begun in 1909, 1907, 1904, 1903, and 1903, respectively, were each 150 feet with and between 1,330 and 1,351 feet long. The longitudinal center of each pier was timber-decked earth fill 80 feet wide, flanked by 35-foot-wide strips of pile-supported timber deck. Combinations of cribbing, sheet piling, and rip-rap retained the central earth fill. The original timber sheet piling and deck systems, built at low initial first cost, had to be extensively repaired on account of decay after 12 to 15 years service. Concrete gradually replaced the central longitudinal deck sections (Greene 1917: 87; Harris 1958; Raber et al. 1985).

Each of these piers had a one-story shed about 1,325 by 144 feet, completed in 1905 or later, with steel framing, wood siding, battered or sloped sides, and cargo doors in every transverse bay. Interior heights to the undersides of steel trusses averaged 17 feet, and to roof peaks about 29 feet (Harris 1958). There was some later replacement of wood siding with metal. American Bridge Company, an enormous subsidiary of U. S. Steel with a commanding position in steel fabrication and dozens of its own subsidiaries, fabricated and/or erected the sheds on piers 105 and 7, to the design of Bush's engineer, B. F. Goodrich (Engineering Record 1905; Darnell 1984; see HAER Nos. NY-201-A and NY-201-B for details on pier and piershed construction).

Pier 6 originated as a solid fill, probably crib retained structure erected in the 1880s, with a series of sheds erected by Bush, beginning in 1895. Bush rebuilt Pier 6 in 1913, making it 1,261 feet long by 276 feet wide, with a "tuning fork" lighter berth about 100 by 25 feet at the outshore end. This pier had a two-story shed, with the upper deck of wood frame construction. The solid fill section was wider than seen at the other piers, but substructure and superstructure design was generally similar to that of the other large terminal piers until extensive modifications sometime c. 1959-60 (Bush 1928: 45; Harris 1958; Raber et al. 1985: 50; Department of Ports, International Trade, and Commerce n.d.).

Pier 7 originated as a solid fill, probably crib-retained structure erected by c. 1885, and used by the Bush and Denzlow Manufacturing Company. Bush completed the present pier in c. 1902-05 as a structure 1,213 by 157 feet, with construction more or less identical to that of piers 1-5, except for a larger proportion of earth fill. The shed was the first completed of the seven terminal piersheds (Engineering Record 1905; Harris 1958; see HAER No. NY-201-A).

Pier 8, a shorter timber pile structure with a timber deck, was built between 1914 and 1920 (New Jersey Harbor Commission 1914: 52; New York, New Jersey Port and Harbor Development Commission 1920: 315). It was acquired by the city of New York in 1958 for incorporation into the 39th Street Terminal project (Harris 1958).

The Short Pier predated Bush Terminal, and originated as a timber pile, timber deck structure over 950 feet long. Bush Terminal development shortened the pier twice, c. 1920 and 1960, adding two railroad tracks during the first shortening episode (Raber et al. 1985: 50).

## 2. Warehouses

The multi-story warehouses lay just back of the bulkhead, divided into six "units." Units A, B, C, E, F, and G (1895-1905) each consisted of a set of three to six warehouses or "stores" separated by firewalls. Most warehouses were about 50 by 150 feet (some were 67 by 200 feet) and four to seven stories high. Some of these buildings were of mill construction, some of open joist construction, and one unit used concrete columns; all were sheathed with brick. The two southernmost buildings (numbered 57 and 58) along the waterfront (1907-1910) were single structures of reinforced concrete construction, 150 feet square with six floors, and basements apparently intended to serve as either factory buildings or warehouses (Harris 1958).

The other warehouses, built c. 1906, were all one story with brick walls and wood or concrete roofs. Most of these (nos. 23-28 and 63-117) were located east of First Avenue between 44th and 50th streets and were about 50 by 150 feet. Exceptions were Nos. 20-22 (called Unit D), located just behind the waterfront row; 18-19; and a few that were replaced in the 1920s by factory loft buildings (Department of Docks and Ferries 1902; Harris 1958; Bush 1928: 45).

## 3. Bush Terminal Railroad

The first tracks were laid about 1896 (Bush 1928: 45). By 1902, portions of the First Avenue classification yard were in place, plus tracks to the existing piers and warehouses, a branch to the 39th Street passenger ferry, and a transfer bridge at the end of Pier 6. By 1915, Bush Terminal Railroad was complete. The yard was six blocks long, with a capacity of 1,000 cars, and Bush had built two transfer bridges at the foot of 51st Street just south of Pier 1, replacing the Pier 6 bridge when the pier was rebuilt. He had also obtained franchises from the city for track in First and Second avenues, extended siding to all terminal piers, warehouses and loft buildings, and established public freight stations and team track yards at 29th, 37th, 39th, 48th, and 54th streets (see Figure 2;

Department of Docks and Ferries 1902; American Railroad Engineering Association 1904: 185; New York New Jersey Port and Harbor Development Commission 1920: 138; Curlett 1947: 115; Harris 1958: Appendix B).

#### 4. Factory Loft Buildings

Bush built six-story Loft No. 1 c. 1904, a 600-by-75-foot brick structure at 37th Street between Second and Third avenues. Lofts 208 were built in succession up Second Avenue c. 1904-15, all but nos. 2 and 3 occupying full 700-foot block lengths and 75-foot widths: 2 and 3 were shorter due to pre-existing buildings fronting Third Avenue. This series of lofts was of reinforced concrete construction, designed for maximum window space and excellent access to rail sidings in the courtyards between buildings. Lofts 9 and 10 were added to this row 1916-1918. Lofts 19 and 20 were built 1912 on Second Avenue between 39th and 41st streets; lofts 22-26 were built in the 1920s on First Avenue between the same two streets. The later buildings were shaped differently to meet site requirements, but with minor exceptions shared height, style and construction with lofts 2-8 (see Figure 2; Engineering Record 1906a, 1906b; Brooklyn League Committee on Industrial Advancement 1914; New York Times 1984).

#### 5. Other Buildings and Facilities

Other terminal structures included a three-story brick office building (c. 1895-1902, with later modifications) and a one-story brick longshoremen's center (c. 1915-20) on the waterfront between warehouse units C and E at the foot of 43rd Street, a steel-framed brick power plant (c. 1917-25) on the waterfront just east of Pier 7, and a reinforced concrete steam plant (c. 1917-25) on the south corner of Second Avenue and 32nd Street for the loft buildings. The terminal also had a fire protection system which included a steel water tower (c. 1920) between warehouse units E and F east of Pier 4, and a pump house (c. 1910) adjacent to the longshoremen's center (see Figure 2; Department of Docks and Ferries 1902; Hyde 1912, 1917; Sanborn Map Company 1928; Army Corps of Engineers 1942, 1953, 1965, 1978).

#### D. Significant Engineering, Architectural, and Cargo-Handling Features

Irving Bush's initial terminal plans focused on problems of waterfront cargo handling. While Bush Terminal was most innovative in its combination of facilities and services, as discussed above, it also included a number of simple but important solutions to cargo handling problems in the Port of New York. These solutions, representing both engineering and traffic management decisions, made Bush Terminal unusually efficient among regional freight-handling facilities.

By the late 19th century, the principal problems for cargo handling in this port were high traffic volume and intense demands for wharfage, mixed cargoes and the need for extensive handling of different cargo types and sizes, extremely complex distribution patterns for waterfront cargo, and the lack of unified rail service around the enormously port periphery. Wharfage demands and land prices generally eliminated the possibility of using wide, marginal wharves, and led instead to construction of narrow, easily congested piers. Mixed cargoes and the need for sorting eliminated effective introduction of mechanical handling equipment for commodities other than coal and grain. Various types of trucks and drays were instead deployed, in large numbers. The range of short term, off-vessel cargo destinations included waterfront warehouses for storage, pending domestic or foreign distribution, domestic rail distribution by way of carlot or less-than-carlot volumes, direct shipment to a consignee, and transshipment to other vessels by way of lighter. Piers were also used for loading outgoing ships. When Irving Bush began operations, the only prior solution to these problems was construction of multi-story warehouses or stores adjacent to piers, with cargo hoists, most prominently in Brooklyn, north of Gowanus Bay. Cargo handling remained cumbersome, inefficient, and time-consuming (Department of Docks and Ferries 1912; New York New Jersey Port and Harbor Development Commission 1920; Raber, Flagg, Wiegand, and Antici 1984; Raber, Flagg, Parrott, Henn, Levin and Wiegand 1984; Raber et al. 1985).

Bush and his staff also thought through most problems in cargo handling between ship and warehouse, and combined innovative, conservative, and low-cost designs for the piers and piersheds. Continuing earlier South Brooklyn practice, Bush converted the need to dredge slips in shallow offshore bottoms into a source of fill for solid piers capable of carrying very heavy loads, including railroad cars. His piersheds were extremely unusual in combining battered sides, wooden siding, and excessively narrow aprons -- generally not used in the port after c. 1890 -- with steel framing and cargo doors in every shed bay, at a time when the latter features were only just beginning to appear. The steel framing attracted attention when first used on Pier 7 in 1905, because of the speed of construction. Battered sides, originally seen in some 19th century piersheds in response to sail vessel spars reduced cargo storage space somewhat but gave Bush Terminal piers the advantage of allowing for cargo movement, using only the masts, booms, and the tackle aboard ships, with occasional use of portable winches on pier decks. Although the use of piershed cargo masts, and burtoning systems, using winches on ship and pier became common at general cargo piers in the port after c. 1910, Bush never added cargo moving facilities at his piers. The continuous doors, lifted up to the shed roofs, allowed for rapid movement of cargo at any point along the pier (Department of Docks and Ferries 1912; Greene 1917: 168; Raber, Flagg Antici, and Wiegand 1984; see HAER Nos. NY-201-A and NY-201-B).

Inside the piersheds and along the waterfront, handling facilities were more traditional but carefully considered. After studying piershed-warehouse movement c. 1905-10, Bush Terminal managers concluded that the mix of cargo destinations made most mechanical handling equipment unsuitable and inelastic for their operations. They relied instead on hand trucks inside the piersheds, low flat horse trucks or storage battery crane trucks between pier and warehouse and, for movement between bulkhead and warehouse, electric winches at street level and whip hoists atop the warehouses. The latter arrangement was found to be much faster than using warehouse elevators (Department of Docks and Ferries 1912).

Behind the piers, Bush's warehouses and factory loft buildings have significance as a collection of commercial structures reflecting several periods of design and innovation. The brick warehouses are direct descendants of "stores" built in Brooklyn and elsewhere in the port between c. 1840 and 1880, but the six-story reinforced concrete loft (factory) buildings begun in 1904 attracted attention at the time for their design and rapid construction. Lofts 2-8, completed by 1914, emphasized simple but effective ornament, large window space made possible by reinforced concrete, and fireproof construction (Engineering Record 1906a). By 1930, eight other loft buildings were completed, employing similar construction, style, and height.

#### E. Description and Brief History of Operations

The loft operations were generally distinct from those of the piers and warehouses. Although not well-documented at present, it appears that the numerous manufacturing operations at the terminal were served primarily by the Bush Terminal Railroad, while shipping and stevedoring companies used the piers and warehouses for handling bulk products. Very little warehouse freight consisted of domestic production awaiting shipment from the piers. The railroad linked all terminal facilities, however. The warehouses were used mainly to store goods that had been received from steamships by way of the piers, and were being held for domestic consumption. Bush Terminal provided a full warehousing service, including trucking to other parts of the city. The principal commodities handled, at least until the Depression, included coffee, cocoa, peas and beans, flour, rubber, tobacco, gums, dried fruit, and citrus fruit, most of which were in bags (Department of Docks and Ferries 1912: 29-35; New York New Jersey Port and Harbor Development Commission 1920: 315-16).

In common with most Port of New York pier traffic, lighters handled much of the loading and unloading of ships at the Bush Terminal piers occurred from "offside" - from the side of the ship away from the pier. Until the 1960s, Most export freight arrived at the harbor by rail, loaded onto covered or open lighters owned by the railroads, and delivered to shipside by railroad

tugs - all of which was included in the freight rate to New York. Cargo from lighters could be unloaded into the ship without going through the pier shed, loaded from lighters onto pier decks before being loaded aboard ship, if, for example, sorting or a particular loading sequence was required. The use of terminal warehouses primarily for bulk commodity led to less Bush Terminal dependence on lighterage than was the case elsewhere.

Bush Terminal Railroad handled all marine service with a limited amount of equipment, consisting of two underpowered wooden steam tugs named Eleanor and Beatrice, six steel 3-track carfloats with capacities of About 18 cars, and two old wooden floats. All cars came and went on Bush Terminal carfloats (as opposed to those of the main line railroad companies). The tugs would pick them up one by one from the New Jersey side, or from the New Haven Railroad Oak Point yard in the Bronx, and bring them to the Bush Terminal transfer bridges. At the terminal, the cars would be moved into the First Avenue yards, which had a capacity of 2,000 cars, and delivered to the piers, warehouses, or factories. The piers received cars from the middle section of the yard, which was divided by ladder (access) tracks into three sections. Although Bush Terminal street trackage was electrified (600 volts DC, like trolley cars), the switching tracks, including those on the piers, were operated by steam engines and not electrified (personal communication, Thomas Costello).

Bush Terminal went into receivership during The Depression, but the traffic and handling pattern just described persisted until World War II. Although little information on the receivership period is available, it was apparently at this time that the loft versus warehouse and pier operations were legally separated as the Bush Terminal Buildings Company and the Bush Terminal Company, respectively.

The Federal Government commandeered all the Bush Terminal piers and warehouses during the two world wars. World War I effects on terminal operations have not been documented, but during World War II traffic and handling patterns changed dramatically. Tugs from other railroads brought cars on any carfloat in the harbor. Huge amounts of traffic were handled, with Depression-era levels of 1,000 cars a week approximately doubled. Long strings of cars went onto the piers with military supplies, filled with anything from turkeys or oranges to bombsights. There were often 100 cars per night for the piers, directed by the Army. The cars were spotted in the piers while the longshoremen were at lunch, with a man going along and opening car doors so that all would be ready for the longshoremen when they returned. In this period, discontinued trackage from Bush Terminal into the Army base to the south was renewed and connections resumed. First Avenue cobble surfaces were paved by the Army, so that tanks could go from the Army base to Bush Terminal piers (personal communication, Thomas Costello).

By the 1960s, Port of New York truck and container shipments began a decline in the break-bulk cargo handling and rail service on which Bush Terminal and many neighboring adjoining had grown. The terminal's three separate corporate components -- railroad, pier and warehouse, and lofts -- had divergent final years in the face of these changes. In 1965, Helmsley-Spear Associates acquired the Bush Terminal Buildings Company holdings, including all the lofts and some smaller structure, and continued to operate them as "Industry City at Bush Terminal." By about 1970, the waterfront and railroad operations were no longer economically viable. The city of New York took over the piers, warehouses, and railroad between 1971 and 1973, and has since that time made a number of efforts to sustain industrial operations.

Contraction of demands for lightering service had gradually ravaged Bush Terminal Railroad operations. Weekly rail traffic declined to about 200 cars until the railroad obtained permission from the Interstate Commerce Commission to abandon operations in 1971. The advent of Conrail in 1976 formally terminated all railroad lightering service to piers in the harbor. By this time, shipping companies needing such services for shipments too big or heavy for handling by truck hired lighters and floating cranes to make the transfer. Maintenance of the railroad was necessary to retain some of the Helmsley-Spear industrial tenants in Brooklyn, however, and New York City turned over operation of the line to the New York Dock Railroad in 1973. New York Cross Harbor Railroad Terminal Corporation, successor to New York Dock, took over the railroad in 1983 (Department of Ports and Trade 1973; New York Times 1984).

The demise of break-bulk cargo handling had also eliminated Bush Terminal Company's shipping tenants. The company operated the piers and warehouses itself through the 1960s, making some alterations on the waterfront to accommodate truck traffic, and survived as a corporate for some years after municipal acquisition of the waterfront. Bush Terminal Company operated piers 5-7 as a tenant until c. 1978-80, when these piers went out of service for most purposes except tie-up of floating equipment and barges. On August 23, 1981, most of piers 5 and 6 burned in a spectacular fire. Since then, there have been frequent small fires on piers 5-7, and a fire in July 1985 demolished virtually all remnants of the Pier 6 superstructure (Towline 1982).

In 1974, the New York Department of Ports and Terminals leased piers 1-4 to Northeast Marine Terminal Company, with the city agreeing to demolish the piersheds and most other pier components, while the subcontractor would fill between piers 1-4 to create upland for parking of containers. That same year, the contractor began removal of pier sheds and wooden aprons, all decks, and filling between the piers. By 1978, piers 1-4 were out of service, with sheds removed, and some fill between the piers. The filling



project was halted several times, and after Northeast Marine Terminal went bankrupt in 1980, the entire project of conversion to container operations ceased.

#### F. 1988 Conditions

Most of the Bush Terminal upland remains substantially intact, but the waterfront structures have been severely altered by demolition, filling, fire, and neglect since c. 1971. All warehouses except Buildings E and F survive in largely original condition, with facades of most of the other multi-storied warehouses in the 1950s and 1960s by modern replacement windows. The factory loft buildings all remain in use, in essentially original condition, as "Industry City at Bush Terminal." They form a striking and harmonious grouping, whether seen from the water or from the Gowanus Express sway over Third Avenue. Of the other upland structures, the brick office building is rented for office space, the steel water tower between warehouse units E and F still stands, the one-story brick longshoremen's center is now the Camelot restaurant, the power plant just east of Pier 7 stands abandoned with its equipment gone, and the loft buildings steam plant still operates on the south corner of 2nd Avenue and 32nd Street.

The team yard at 31st Street has been removed and paved over for parking, and the team yard at 29th Street is now a one-story brick factory. Aside from these two yards, most of the Bush Terminal Railroad trackage remains, but much of it went out of service in the 1970s, and the freight house on 48th Street is abandoned. New York Cross Harbor Railroad Terminal Corporation continues to operate part of the surviving system, including the two transfer bridges.

On the waterfront, only the Short Pier and the 1960's bulkhead sheds north of piers 5 and 6 remain entirely intact. Piers 1 through 4 have largely disappeared under the 1978-80 filling program, although the solid fill cores and decks of these piers can still be seen in places. The east ends of Piers 5 and 7 each retain about three hundred feet of partly intact shed, with standing columns, trusses, roof sections, and offices. The rest of these piersheds are essentially twisted metal sculptures, as is the Pier 6 shed. Despite these indignities, the east ends of Piers 5 and 7 retain the distinctive shed sides, cargo doors, and Bush Terminal colors which once highlighted the South Brooklyn waterfront.

## PART II. SOURCES OF INFORMATION

### Plans and Drawings

Very few original drawings of Bush Terminal structures have been found in the various repositories visited during research presented in this documentation. The accompanying documentation of Piers 5 and 7 (see HAER Nos. NY-201-A and NY-201-B) includes one 1902 drawing of Pier 5. Permit files maintained by the city of New York Department of Ports and Trade include limited numbers of plans for pier modifications, most of which post-date 1960.

### Historic Views

General views of Bush Terminal, with occasional details of individual structures, appear in many published and unpublished sources. Aerial views were taken frequently, since the terminal's scale defied much visual comprehension from the ground. Published views appear, among other sources, in Corps of Engineers 1926 and 1932, Brooklyn League 1014, Bush 1928, and Rush 1920. Unpublished views from 1958 appear in Harris 1958, two of which are reproduced with this documentation, and many aerial and ground views from c. 1972-1985 are in the collection of Thomas Flagg, Bogota, New Jersey. The city of New York Department of Ports and Trade also has aerial views from the 1970s and 1980s.

### Personal Communication

Thomas Costello, December 7, 1975. Costello, interviewed by Thomas Flagg, worked at Bush Terminal from 1932 to 1973, mostly as a tug dispatcher. Transcript in collection of Thomas Flagg, Bogota, New Jersey.

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UTM references for points A-L, bounding waterfront parcel, appear on Page 1

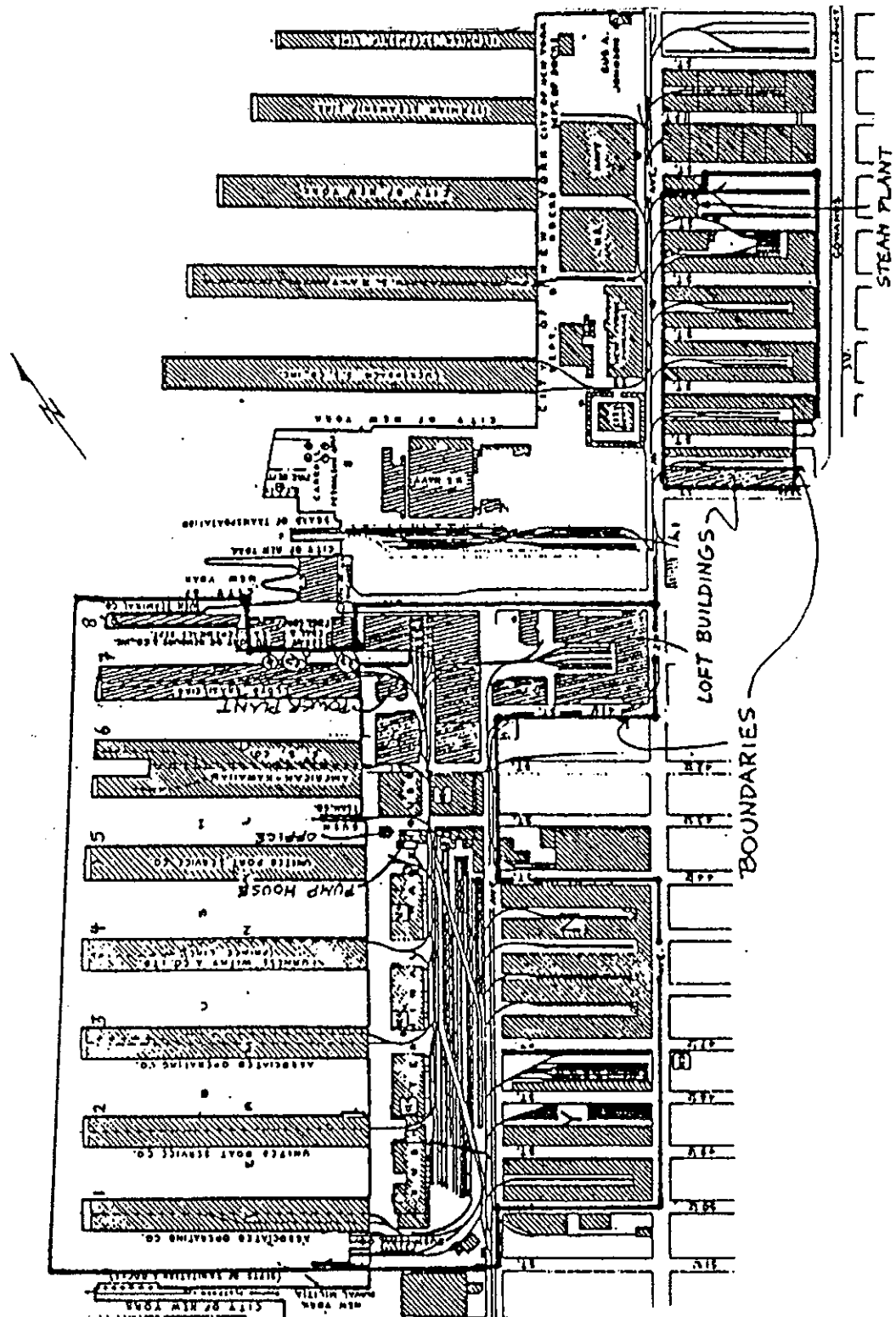


Figure 2. BUSH TERMINAL IN 1942  
 source: Army Corps of Engineers 1942